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A juvenile *Stereolepis doederleini* (Polyprionidae) from a tidal pool at Jeju Island, Korea

by

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Résumé. – Un *Stereolepis doederleini* (Polyprionidae) juvénile capturé dans une mare intertidale sur l'île de Jeju, Corée du Sud.

Un individu juvénile de *Stereolepis doederleini* a été capturé dans une mare intertidale sur la côte Est de l'île de Jeju, en Corée du Sud, le 11 mai 2017. C'est la première fois qu'un juvénile de cette espèce est capturé en Corée du Sud. Il se caractérise par : une tête et un corps noirs, l'extrémité postérieure du maxillaire dépassant la moitié de l'œil, l'extrémité postérieure de la nageoire pelvienne atteignant l'anus, 11 épines et 10 rayons à la nageoire dorsale, et trois épines et sept rayons à la nageoire anale.

Key words. – Polyprionidae – *Stereolepis doederleini* – Korea – Jeju Island – Tidal pool – Nursery.

Tidal pools on the seashore commonly retain seawater throughout the tidal cycle (Kwun *et al.*, 2017). They are unique biological habitats and are important places for marine fishes (Metaxas and Scheibling, 1993; Choi *et al.*, 2008; González-Murcia *et al.*, 2012; Choi and Lee, 2013). Larvae and juvenile fishes use tidal pools as nursery grounds (Beckley, 1985; Bennett, 1987; Cunha *et al.*, 2008; Lobato *et al.*, 2016).

The genus *Stereolepis* (Polyprionidae) is a marine and bathydemersal group of teleost fishes that inhabits areas having rocky substratum at depths of 400–600 m. The genus comprises only two species worldwide (Froese and Pauly, 2017), *Stereolepis doederleini* Lindberg & Krasnyukova, 1969, and *Stereolepis gigas* Ayres, 1859, distributed in the northwestern and eastern Pacific (Eschmeyer *et al.*, 2017). *S. doederleini* has been reported from near Busan, south of Korea, and from Hokkaido to Yakushima Island, in Japan (Yamada *et al.*, 2009). Adults of this species grow to a maximum length of 2 m and a maximum weight of 84 kg (Froese and Pauly, 2017). The early life stages of this species are poorly known.

In May 2017, a juvenile of *Stereolepis doederleini* was collected from a tidal pool on the eastern coast of Jeju Island, Korea. This is the first report for Korea of an early life stage of *S. doederleini*, and it is also the first report of the occurrence of this species in a tidal pool. A morphological description of the specimen and discussion of the ecological implications are also provided.

MATERIALS AND METHODS

A single specimen of juvenile *Stereolepis doederleini* was collected from the tidal pool on 11 May 2017 using a hand net (mesh size 1 mm), and was fixed in 99% ethanol. The species identifica-

tion was based on Okiyama (2014). All counts and measurements were made according to Nakabo (2013). The fin rays were counted using a stereomicroscope. Measurements were made to the nearest 0.1 mm using a stereomicroscope camera and associated imaging software (Leica Application Suite V.4.7.1, Germany). The specimen is deposited in the Marine Fish Diversity (MFD) of the National Marine Biodiversity Institute of Korea.

Material examined

MFD-1025: 1 specimen, 14.8 mm in standard length (SL), hand net collection, 11 May 2017; Seongsan, Seogwipo, Jeju Island, Korea.

DESCRIPTION

Specimen details are shown in table I. Proportions as a percentage of the SL were: head length (HL), 43.9; body depth, 43.2; caudal peduncle depth, 14.2; predorsal length, 50.7; prepelvic length, 42.6; prepectoral length, 42.6; preanal length, 71.6; dorsal fin base length, 41.2; anal fin base length, 14.9; pectoral fin length, 23.6; and pelvic fin length, 31.1. The proportions as a percentage of the HL were: snout length, 20.0; postorbital length, 41.5; suborbital width, 6.2; interorbital width, 35.4; eye diameter, 38.5; and upper jaw length, 47.7.

Body slightly short, compressed and oval. Head and body somewhat deep. Snout somewhat short and pointed. Mouth terminal and moderately large, posterior tip of the maxilla beyond the middle of the eye. Small conical teeth on both jaws. Eye large, interorbital region slightly convex. Single uppermost spine and six small spines on the posterior margin of each operculum, eight pungent spines on the posterior margin of the preopercula and five small spines present on posttemporal bone. Pectoral and caudal fins rounded. Pelvic fin long, posterior tip reaching the anus. Body covered by small ctenoid scales. Single lateral line extending to the caudal fin base.

Colouration

When fresh (Fig. 1A), the head and body were darkish brown. Caudal fin base whitish, with a small dark blotch on the middle of the base. Spinous and soft rayed portions of the base of the dorsal fin, the soft rayed portion of the base of the anal fin, and the pelvic fin all darkish brown, but pectoral fin, soft rayed portion of the dorsal and anal fins, and the caudal fin all semi-transparent. After alcohol fixation, the head and body brown (Fig. 1B).

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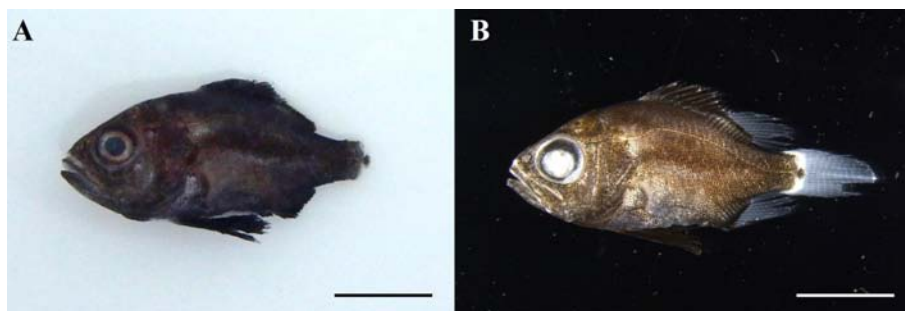


Figure 1. – *Stereolepis doederleini*, MFD-1025, 14.8 mm SL. A: Fresh, B: Preserved. Scale bar = 5 mm.

Table I. – Comparison of meristic characters of *Stereolepis* species.

	<i>Stereolepis doederleini</i>		<i>Stereolepis gigas</i>
	Present study	Okiyama (2014)	Shane <i>et al.</i> (1996)
Number of specimens	1	ñ	4
Standard length (mm)	14.8	ñ	18.8–54.7
Dorsal fin rays	XI, 10	XI, 10	XI+II, 9–10
Anal fin rays	III, 7	III, 7–8	III, 8–9
Pectoral fin rays	18	18–19	18–19
Pelvic fin rays	I, 5	I, 5	I, 5

DISCUSSION

Adult *Stereolepis doederleini* are only known to occur in Korea and Japan (Yamada *et al.*, 2009). The early life stages of this species are poorly known, although their occurrence has yet been recorded (Noichi *et al.*, 1990). A single specimen, collected from a tidal pool on the eastern coast of Jeju Island, was assigned to the genus *Stereolepis* based on the body shape and colouration (Noichi *et al.*, 1990; Shane *et al.*, 1996; Okiyama, 2014). It was identified as *S. doederleini* because it has a shorter pelvic fin than *S. gigas* (in *S. doederleini*, the tip of the pelvic fin does not extend beyond the origin of the anal fin, but does in *S. gigas*), and the number of dorsal fin spines is consistent with *S. doederleini* (11 in *S. doederleini*; 12–13 in *S. gigas*) (Tab. I; Fig. 1; Shane *et al.*, 1996; Okiyama, 2014).

The spawning of *S. doederleini* is estimated to occur from northwest of Kyushu (Japan) to the southwest of the East Sea (Korea) from late spring to early summer (March to June) at depths of 100–200 m (Yamada *et al.*, 2009). Larvae and juvenile stages (8–30 mm) of *S. doederleini* have been reported in coastal waters from April to June (Yamada *et al.*, 2009; Okiyama, 2014). Therefore, the 14.8 mm SL specimen collected in May is estimated to have been spawned at early April, and to have moved with the current along the eastern coast of Jeju Island.

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REFERENCES

- BECKLEY L.E., 1985. – The fish community of East Cape tidal pools and an assessment of the nursery function of this habitat. *S. Afr. J. Zool.*, 20: 21–27.
- BENNETT B.A., 1987. – The rock-pool fish community of Koppie Alleen and an assessment of the importance of Cape rock-pools as nurseries for juvenile fish. *S. Afr. J. Zool.*, 22: 25–32.
- CHOI Y. & LEE H.H., 2013. – Species composition and vertical distribution pattern of fish in rock tidal pools at Mohang, Taeanhaean National Park. *Korean J. Ichthyol.*, 25: 227–233. [in Korean]
- CHOI Y., LEE H.H. & JANG J.H., 2008. – Ichthyofauna of the intertidal zone around the nuclear power plants off Sinweolweong, eastern coast, Korea. *Korean J. Ichthyol.*, 20: 313–317. [in Korean]
- CUNHA E.A., CARVALHO R.A.A., MONTEIRO-NETO C., MORAES L.E.S. & ARÚJO M.E., 2008. – Comparative analysis of tidepool fish species composition on tropical coastal rocky reefs at State of Ceará, Brazil. *Iheringia Sér. Zool.*, 98: 379–390.
- ESCHMEYER W.N., FRICKE R. & VAN DER LAAN R., 2017. J Catalog of fishes: genera, species, references. <http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>. Accessed 27 Jul. 2017.
- FROESE R. & PAULY D., 2017. – FishBase. <http://www.fishbase.org>. Accessed 27 Jul. 2017.
- GONZÁLEZ-MURCIA S., MARÍN-MARTÍNEZ C. & AYALABOCOS A., 2012. – Intertidal rockpool ichthyofaunal of El Pital, La Libertad, El Salvador. *Check List*, 8: 1216–1219.
- KWUN H.J., PARK J., KIM H.S. & BAE H., 2017. – Preliminary report on fish diversity in the tidal pools of Jeju Island, Korea. *Mar. Biodivers.*, 47: 957–963.
- LOBATO C.M.C., SOARES B.E., BEGOT T.O.R. & MONTAG L.F.A., 2016. – Tidal pools as habitat for juvenile of the goliath grouper *Epinephelus itajara* (Lichtenstein 1822) in the Amazonian coastal zone, Brazil. *Nat. Conserv.*, 14: 20–23.
- METAXAS A. & SCHEIBLING R.E., 1993. – Community structure and organization of tidepools. *Mar. Ecol. Prog. Ser.*, 98: 187–198.
- NAKABO T., 2013. – Fishes of Japan with Pictorial Keys to the Species. 3rd edit., 2428 p. Hadano: Tokai Univ. Press. [in Japanese]
- NOICHI T., KANBARA T., MITO T., SAKAMOTO F., KIMURA M. & SENTA T., 1990. – Occurrence and ecology of juvenile striped jewfish *Stereolepis doederleini* (Family Percichthyidae) in Yanagihama Beach, Nagasaki Prefecture. *Bull. Fac. Fish. Nagasaki Univ.*, 68: 29–34. [in Japanese]
- OKIYAMA M., 2014. – An Atlas of Early Stage Fishes in Japan. 2nd edit., 1639 p. Hadano: Tokai Univ. Press. [in Japanese]
- SHANE M.A., WATSON W. & MOSER H.G., 1996. – Polyprionidae: Giant sea basses and wreckfishes. In: *The Early Stages of Fishes in the California Current Region*, California Cooperative Oceanic Fisheries Investigations Atlas No. 33 (Moser H.G., ed.), pp. 873–875. La Jolla: National Marine Fisheries Service Southwest Fisheries Science Center.
- YAMADA U., TOKIMURA M., HORIKAWA H. & NAKABO T., 2007. – Fishes and Fisheries of the East China and Yellow Seas. 1262 p. Hadano: Tokai Univ. Press. [in Japanese]